



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/683,712	10/10/2003	Georg Bogner	12406-127001 / P2001,0258	2057
26161	7590	12/28/2007	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			NGUYEN, JOSEPH H	
			ART UNIT	PAPER NUMBER
			2815	
			MAIL DATE	DELIVERY MODE
			12/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/683,712	Applicant(s) BOGNER ET AL.	
	Examiner Joseph Nguyen	Art Unit 2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-15,25,27,28,30,31,33-49,52 and 54-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-15,25,27,28,30,31,33-49,52 and 54-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/31/2007 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 8 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "the chip" in line 3. There is insufficient antecedent basis for this limitation in the claim 8. The term "chip" is not previously recited in claim 1 from which claim 8 depends

Claim 23 recites the limitation "the chip" in line 2. There is insufficient antecedent basis for this limitation in the claim 23. The term "chip" is not previously recited in claim 17 from which claim 23 depends.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 6-7, 10, 13, 15, 17-22, 24-25, 27-28, 60-31, 33-34, 38-40, 43-46, 52 and 55-63 rejected under 35 U.S.C. 102(b) as being anticipated by Arndt (US Patent No. 6,376,902).

Regarding claim 1, Arndt discloses in figures 1A-1B a lead-frame for a radiation emitting component comprising a mount part having at least one wire connecting area 16; an opening formed therein and extending completely through the mount part; and at least one external electrical connecting strip 4, 9; and a thermal connecting part 2, 7 disposed in said opening and fastened into said mount part to form an electrical connection with the at least external electrical connecting strip, said thermal connecting part having at least one chip mounting area and a reflector well 11 surrounding said chip mounting area wherein the thermal connecting part 2, 7 extends through the opening in the mount part and connects to the mount part at the opening to transfer heat away from the mount part.

It is noted that the term "separately manufactured" is merely the product by process. MPEP § 2113 states that even though product by process claims are limited by and defined by the process, determination of patentability is based on the product itself.

The patentability of a product does not depend upon its method of production. If the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product made by a different process. In re Thorpe, 777, F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Regarding claims 2-4, 6-7, 10, 13, 15, 17-22, 24-25, 27-28, 30-31, 33-34, 38-40, 43-46, 52 and 55-63, Arndt discloses in figures 1A-1B all the structures set forth in the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt.

Regarding claim 8, Arndt discloses in figures 1A-1B the reflector well 11 has a height greater than the chip 1 but not necessarily the reflector well having height no greater than twice a height of the chip. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Arndt by including the reflector well having height no greater than twice a height of the chip, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 23, Arndt discloses in figures 1A-1B the reflector well 11 has a height greater than the chip 1 but not necessarily an overall height of said reflector being no greater than four times a height of the chip. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify Arndt by including an overall height of said reflector being no greater than four times a height of the chip, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 9 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt in view of Carey et al. (US Patent No. 6,271,924).

Regarding claim 9, Arndt discloses in figures 1A-1B the thermal connecting part 2, 7 made of metal but necessarily of copper. However, Carey et al. the thermal connecting part can be made of copper to effectively dissipate heat away from the chip (column 2, lines 45-50). In view of such teaching, it would have been obvious at the time of the present invention to modify Arndt by including the thermal connecting part made of copper to effectively dissipate heat away from the chip.

Regarding claim 35, Arndt discloses in figures 1A-1B the plastic compound 22. Arndt does not disclose the plastic compound contains a silicone resin. However, Carey et al. discloses in column 3, lines 11-15 the plastic compound contains silicone resin to form an optically transparent material protecting the chip. In view of such teaching, it would have been obvious at the time of the present invention to modify Arndt by

including the plastic compound containing silicone resin to form an optically transparent material protecting the chip.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt in view of Parthasarathi (US Patent No. 5,650,663).

Regarding claim 12, Arndt discloses in figures 1A-1B substantially all the structure set forth in claim 12 except the lead-frame containing copper. However, Parthasarathi discloses in column 2, lines 18-22 the lead frame 16 contains copper to effectively form an electrical connection between the chip and the external circuit. In view of such teaching, it would have been obvious at the time of the present invention to modify Arndt by including the lead frame containing copper to effectively form an electrical connection between the chip and the external circuit.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt in view of Han et al. (US Publication No. 2001/0054761).

Regarding claim 14, Arndt discloses in figures 1A-1B substantially all the structure set forth in claim 14 except the surface coating being a gold coating. However, Han discloses in paragraph [0022], lines 4-5 the surface coating is a gold coating to form an better effective electrical external connection because gold is good electrical conductive, oxidation resistant. In view of such teaching, it would have been obvious at the time of the present invention to modify Arndt by including the surface coating being a gold coating to form a better effective electrical external connection.

Claims 41-42 and 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt in view of Matsumoto et al. (JP402187058).

Regarding claim 41, Arndt discloses in figures 1A-1B substantially all the structure set forth in the claimed invention except the chip being mounted on the chip mounting area by a silver solder. However, Matsumoto et al. discloses in figure 4 the chip 5 being mounted on the chip mounting area by a silver solder 6 (see Abstract). In view of such teaching, it would have been obvious at the time of the present invention to modify Arndt by having the chip being mounted on the chip mounting area by a silver solder to improve heat radiation (Abstract of Matsumoto).

Regarding claim 42, it is inherent the silver solder has a melting temperature greater than 260 C.

Regarding claims 47-48, similar to rejection of claims 41-42 above, the combination of Arndt and Matsumoto discloses all steps of the method set forth in claims 47-48.

Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt in view of Mahulikar et al. (US Patent No. 5,608,267)

Regarding claim 49, Arndt disclose in figures 1A-1B substantially all the structure set forth in claim 49 except the mount part and the thermal connecting part compound being embedded by injection molding in the housing molding compound. However, Mahulikar et al. discloses in figure 2 the mount part (portion where device 12 is mounted

on) and the thermal connecting part 26' is embedded in the housing molding compound 30 (column 6, lines 61-67). In view of such teaching, it would have been obvious at the time of the present invention to modify Arndt by embedding the mount part and the thermal connecting part in the housing molding compound to effectively package a semiconductor device because injection molding is known as an effective method to form a semiconductor device package.

Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arndt in view of Huang (US 6664649).

Regarding claim 54, Arndt discloses in figures 1A-1B substantially all the structure set forth in claim 17 except an exterior surface to which the bearing surface mounting the housing. However, Huang discloses in figure 5 an exterior surface (printed circuit board) 560 to which the bearing surface (heat sink) 530 mounting the housing to further increase the heat dissipation efficiency (col. 5, lines 15-19). In view of such teaching, it would have been obvious at the time of the present invention to modify Arndt by including an exterior surface to which the bearing surface mounting the housing to further increase the heat dissipation efficiency.

Allowable Subject Matter

Claims 36, 37 and 64 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The reference (s) of record do not teach or suggest, either singularly or in combination at least the limitation of "said reflector well has height no greater than twice a height of the chip" for claim 8, "said radiation permeable compound has a volume described by the volume $V \leq q H$ where H is a height of said chip and q is a scaling factor having a value less than 10 mm^2 " for claims 36 and 64.

Response to Arguments

Applicant's arguments with respect to claims 1-4, 6-15, 17-25, 27-28, 30-31, 33-49, 52 and 54-63 have been considered but are moot in view of the new ground(s) of rejection.

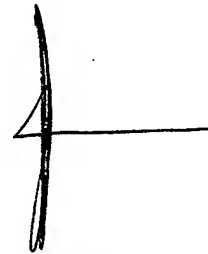
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (571) 272-1734. The examiner can normally be reached on Monday-Friday, 8:30 am- 5:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300 for regular communications.

Application/Control Number:
10/683,712
Art Unit: 2815

Page 10

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'K. Parker', written over a horizontal line.

KENNETH PARKER
SUPERVISORY PATENT EXAMINER

Joseph Nguyen

Patent Examiner

December 12, 2007.